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ABSTRACT

The alphabet can be used as a framework for identifying key issues, ideas, and factors that teachers and students need to consider in developing hypermedia projects. Rather than in alphabetical order, the terms are introduced as they apply to the discussion on the teaching of multimedia skills. The following terms and concepts are highlighted: audience (users); the build-review-revise process; consistency; development of ideas; evaluation; feedback; graphics; help; icons; juristic issue (such as copyright); knowledge of instructional design; learning/instructional styles; metaphor; navigation in the interactive environment; objects; planning; the research question; references; software; terminology; user control; visual effects; webs; "x marks the spot/Y you are here"; and "zoom.". An alphabetical list of the terms, three references, and eighteen suggested readings are provided. (AEF)

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The ABC's Of Screen Design: What Teachers Should Know To Teach Students To Author In Hypermedia

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Teachers bring varied levels of computer expertise and different purposes when they first begin to use a hypermedia application. Some come with the idea that they will learn to design instructional projects for use with their students. Others are more interested in helping students create hypermedia projects through which they can share new knowledge. No matter what the goal, there are certain design considerations that need to be in place as one continues through the project planning and implementation process.

For the purpose of this paper the alphabet is used as the framework for identifying key issues, ideas, and factors we believe should be considered in the planning and implementation process. We have chosen to introduce these terms as they are introduced in our discussion of teaching multimedia skills, rather than in alphabetical order. For easy identification the terms are boldfaces when used in the text. The complete alphabetical listing can be found following the text.

BACKGROUND

Our field has been supported through the years by the research of instructional designers, many of whom are IVLA members. It is important to note that much of their research has provided a knowledge base for instructional design as their findings are used with students and throughout the industry today. Who has not learned to consider the audience before preparing a lesson, a book, a lecture, or an IVLA presentation? The literature on instructional design guides us as we look at the steps in the design process.

It is important to remember that we use instructional design to help a

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learner gain the most they can from a new body of **knowledge**. The issues of good instructional design which are used in planning a lesson preceded the use of computers in the classroom. We have taken what is known about designing good instruction and added to it what we have learned about the power of the visual. With time there has been a growing awareness of the importance of using good visual design, a blend of the earlier literature and experiences of today.

What makes some people learn best when a visual component is present? When we blend the attributes of what we know about good instruction and what we know about good visuals then we are aiming to provide well-designed computer instruction. The rapidly expanding technology challenges us to make use of what we know and reshape it to take advantage of these new opportunities being offered to learners today.

Newest technological advances give the classrooms tools to create multimedia productions with greater ease than was possible before. Publishers of authoring software have considered these new users by creating programs that make it easy for teachers and students to produce hypermedia lessons and reports. More powerful programs exist to create business training software but our interest is in those programs that support students and teachers in the K-12 environment. This includes such software as HyperStudio for the AppleIIGS, the Macintosh and Windows, HyperCard and Digital Chisel for the Macintosh, LinkWay Live for DOS machines and MultiMedia Scrapbook and SuperLink for Windows.

DESIGN ISSUES

We've identified some of the elements that are important for teachers and students in developing hypermedia projects. We have used the alphabet as a way of communicating what is important in talking about the design of hypermedia. Although there are many different aspects of hypermedia that come to mind as you take a letter, we have chosen and

A	B	C	D	E
F	G	H	I	J
A B C's of Screen Design				
K	L	M	N	O
P	Q	R	S	T
U	V	W	X-Y	Z

explained those that have had meaning for us as we teach students how to use hypermedia as a tool in creating projects. We spend a lot of time teaching children the grammar of how to speak and how to write. We have reached a time when it is important to teach our students the grammar of visual communication.

It is the students who are our concern, whether they are in primary school or at the graduate level. Teachers develop instruction plans for their classrooms. It is just as important to

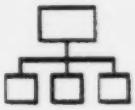
have an instructional plan when developing hypermedia projects. **Planning** is a unique process as it is made up of many variables. One of the first considerations is the classroom of students or the group who will become the **audience** or users. Who are they? What age and gender are they? What ability level, interests, and needs do they have? Some developers use surveys or interviews to find out about their intended users but a teacher has the unique opportunity to learn about his/her audience due to the amount of time spent with them and the records available. When students are to develop their own projects, they, too, must consider the users or audience. Will their project be used with their own class, a younger grade, or a broader audience such as parents or the community? Students can also interview and observe the group for whom they are planning the project. Brainstorming a set of questions to provide the information they are seeking should precede talking to their users.

Once the audience is chosen, it is time to develop another type of question. This one should be concerned with the content of the overall project topic. Once the instructional goal of the project is decided, students will form or be given a question dealing with that goal. The question gives the students the reason for researching information in order to form possible solutions. Students become much more involved and there is higher motivation as they are dealing with real-world situations. These may be current problems such as a polluted river that runs through the town's park, or a problem from the past such as the travel conditions of the pioneers who settled the western United States.

In the **development of ideas** for any project it is important to determine if a similar program already exists. It would certainly not serve any purpose to be redundant except to improve upon an idea, to meet the needs of a different audience or to take a very different approach. As students are looking to form solutions to their problem, it is possible they could repurpose media they have discovered on the topic, in a new way. This might include tapes, recordings, laser discs, text, and/or graphics. There is a **juristic** issue in using media from some sources. Designers must carefully adhere to any copyright issues. Students should create a **reference** screen in their project to give credit to sources of information used. In addition, it is the responsibility of the author/designer to determine the legality of using text or graphics they have chosen, even if they are planning to credit the author or source.

As the students, or designers, begin to gather data to be incorporated into the project, the question becomes, how should this information be translated to hypermedia? Taking advantage of the intended audience's knowledge of their environment, a **metaphor** could be used to convey the concepts of the project. A metaphor uses concrete, familiar ideas so that the users have a set of expectations in place when they use the program. Mark Schlichting, creator and designer of

Broderbund's Living Books, states that the user should be involved with the learning and be having fun instead of being involved with how to run the computer (Apple Computer, Inc., 1994, p. 131). Using software should appear to be intuitive. In order to visualize the organization and development of the project, creating a storyboard can be a useful tool. This may lead directly to constructing a concept map or a **web** to see the relationship of the information.



It is part of the on-going process of **build-review-revise** and **evaluation.** By carefully planning before the on-computer construction, saves time as designers assess each others' screen sketches and ideas for interaction.

Non-interactive hypermedia projects do little more than present information. It is important to take full advantage of these new authoring **software** programs and make certain the designers create an interactive project. The users then become involved with using seeing, hearing, and doing this new knowledge (Anderson & Veljkov, 1990, p.ix). One of the major considerations of this interactive environment will be the **navigation**. This the ability to link one part of any given information to additional information. It is essential that the user not get lost or lose interest. The design of the navigation should be **consistent.** This is to be true for placement and meaning of these links. **Icons** are often used to denote an available path connection. The symbol or **graphic** used should always have the same meaning. Colors can also be used to orientate users. It is important that users always know where they are. Users should be able to reverse any action. This is an area that needs consistent assessment. If any of these features do not work, revision must take place.

Designers need to provide adequate **feedback** to users. This should be timely, short, and expressed appropriately for the users and the task. These can be audio or visual cues to tell the user the software is responding to their input.

The authoring software used in schools is **object**-oriented. Whatever is placed on the screen is an object. These objects have certain properties. Things can be done with or to an object. These are operations, such as moving or copying. Objects also exist in relationship to other objects. When the screens are developed, the user must be considered. What information is the most important to the user? On the introductory screen, it may be the text item (an object) and/or a related graphic item (an object). The **visual effect** of this object should be dominant to motivate and orient the user as to what the information in the program will be about. Additional objects will be placed to help the user navigate to further information. There should be a structure and balance to the screen's objects with the emphasis on the focal point. In Western society visual orientation goes from left to right and top to bottom.

Each screen developed should follow a similar relationship of the objects or elements needed. The screen layout includes size, spacing, and placement of objects to create a visually consistent and predictable environment. It communicates the purpose of the elements displayed.

Other design issues should be taken into consideration. Color is important but it also is personal and it may be negative or distracting. Microsoft in *Windows Interface Guidelines* suggest designing in black and white and then adding color (p. 369). Fonts should also be selected carefully. Avoid italics and limit the number of fonts and styles. Using a common font provides visual consistency. Capitalization of titles is proper but any other text should be displayed with only the first letter of sentences or phrases capitalized. **Graphics** are used to orient, inform, entertain, and enhance information. Be consistent in the placement. The relationship between the graphic and the text should be clear. Other graphics or icons must be consistent in meaning and in placement on each screen. As with color, certain graphics may have a cultural impact. Careful analysis of the users will be needed to prevent this from happening.

Designers should provide **help** for their users. There are a variety of options for the help provision. It might be in the form of an icon branching to a separate screen or to a pop-up text window that displays needed information. Users need to feel that they are in control throughout their interaction with the program. It is important for the designer to create the project with **user control** in mind.

IMPLICATIONS

As noted earlier, instructional designers through the years have influenced the guidelines still in use today in the development of multimedia products. Apple Computer and Microsoft both list in their recent guidelines for the human interface, the same principles of design that have been noted for some time. This is not to say that research should not continue or that there isn't room for improvement on many products.

The guidelines are there. They should be put to use. It is more common place today for teachers and students to use applications such as presentation software, World Wide Web HTML documents and hypermedia programs that allow communication in a combined text and graphics environment. Visual design is an important consideration in the development of these materials. For the professionals in our field it is our responsibility to provide guidance in this arena. Students are given instruction in the rules of clear communication in speech and the rules of clear communication in a traditional text document. Now it is time for them to receive similar guidance so they may learn to communicate more clearly using text and graphics.

List of Alphabetical Terms

A audience
B build review revise
C consistency
D development of ideas
E evaluation
F feedback
G graphics
H help
I icons
J juristic
K knowledge
L learning/instructional styles
M metaphor
N navigation
O objects
P planning
Q question
R references
S software
T terminology
U user control
V visual effects
W webs
X x marks the spot / Y you are here
Z zoom

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